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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LAVARIAS, ARNEL C	
ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 12/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/788,316	LEWIS ET AL.	
	Examiner	Art Unit	
	Arnel C. Lavarias	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,11-14,16,17,25,28-30,33-38,40,41,46-58,65 and 66* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,11-14,16,17,25,28-30,33-38,40,41,46-58,65 and 66* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendments to the specification of the disclosure in the submission dated 10/14/05 are acknowledged and accepted.

2. The amendments to Claims 1, 11, 16-17, 41, and 58 in the submission dated 10/14/05 are acknowledged and accepted.

3. The cancellation of Claims 2-10, 15, 18-23, 26, 31, 42-45, and 64 in the submission dated 10/14/05 is acknowledged and accepted.

4. The addition of Claims 65-66 in the submission dated 10/14/05 is acknowledged and accepted.

Response to Arguments

5. The submission of a declaration stating that the amendatory material to correct the incorporation by reference consists of the same material incorporated by reference in the referencing application is noted. The amendments to the specification to correct the incorporation by reference are also noted. However, these amendments do not overcome the objections to the specification in Section 8 of the Office Action dated 11/12/03 and Sections 10-11 of the Office Action dated 4/14/05. In particular, the Applicants failed to specifically delete the incorporation by reference statement (i.e. specifically line 10 on Page 12 of the original specification) since this statement is now no longer necessary due to previous amendments made to the specification of the disclosure.

6. The Applicants argue that, with respect to newly amended Claims 1, 41, and 58, the combined teachings of Kley et al. and Erickson fail to teach or reasonably suggest selecting wavelengths of interest, via a tunable filter positioned between the sample and the infrared image detector. The Examiner respectfully disagrees. In particular, Kley et al. discloses that the detection system may include dispersive elements coupled to it. The dispersive elements may be moved (e.g. translated or rotated) to scan different wavelengths across the detectors (See col. 6, lines 13-37 of Kley et al.), which effective acts as a tunable wavelength filter for the detectors. Also, though Erickson does not explicitly disclose utilizing a tunable filter, the general use of filters in the disclosed spectroscopic imaging system is suggested (See for example col. 5, lines 11-35; col. 7, lines 7-15; col. 21, line 60-col. 22, line 3 in Erickson). In addition, the Examiner notes that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In the instant case, the teachings of Erickson are being utilized to provide evidence for the use of infrared sources and two-dimensional detection elements for spectroscopic imaging systems, such as that disclosed by both Kley et al. and Erickson. The modification of the system for so-called 'on-axis' or 'off-axis' light is irrelevant since such limitations are not recited in the claims.

7. Claims 1, 11-14, 16-17, 25, 28-30, 33-38, 40-41, 46-58, 65-66 are now rejected as follows.

Specification

8. The attempt to incorporate non-essential subject matter into this application by reference to U.S. Application No. 09/345,672 is improper because Applicants have not provided sufficient evidence of common assignment or co-ownership between the instant application and the 09/345,672 application. See MPEP 608.01(p).

9. The amendments filed 12/20/04 and 12/27/04 are objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:
All amendments to the specification on Pages 2-8 of the submission dated 12/20/04.
All amendments to the specification on Pages 2-7 of the submission dated 12/27/04.
Applicants may overcome this objection by 1) canceling the new matter in the reply to this Office Action, or 2) performing the actions as set forth in either Section 5a or 5b of the Office Action dated 4/14/05 in reply to this Office Action.

Claim Objections

10. Claims 41, 46-57 are objected to because of the following informalities:
Claim 41 recites the limitation "the step of illuminating using a tunable filter" in line 6. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination, this limitation has been interpreted to mean "the step of illuminating using

the beams of broadband infrared light". Claims 46-57 are dependent on Claim 41, and hence inherit the deficiencies of Claim 41.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1, 11, 28, 30, 33, 41, 46-49, 58, 66, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kley et al. (U.S. Patent No. 6172743), of record, in view of Erickson (U.S. Patent No. 5440388), of record.

Kley et al. discloses a spectrometer and spectrometry method (See for example Figures 1-5), the spectrometer and method both comprising an array of broadband illumination sources of the same type (See for example 3A, 3B in Figure 1, which are both LED's), such as semiconductor-based sources, LED's, or infrared or near-infrared sources (See 2, 3A, 3B in Figure 1; col. 4, line 65-col. 6, line 11; col. 9, line 65-col. 10, line 20), positioned to differently illuminate different parts of a detection area (See 6 in Figure 1) by directing a plurality of differently directed beams of broadband light that each include energy at different wavelengths (See for example col. 2, lines 26-42) toward the detection area from at least first and second different illumination source positions at the same time; an image detector (See 8 in Figure 1), such as a multi-element detector

array, positioned at a third position different from the first and second positions to receive infrared light from the sources reflected (See col. 12, lines 41-55) off of the different parts of a sample surface in the detection area; a tunable filter positioned between the sample and the infrared image detector (See col. 6, lines 13-37) for selecting wavelengths of interest from the broadband source after it has reflected off the same surface; and a spectroscopic signal output (See 8, 7, 9 in Figure 1) responsive to relative amounts of infrared light from the different ones of the plurality of beams in different spectral regions received by the detector after reflection off of the different parts of the sample surface in the detection area (See col. 8, line 50-col. 10, line 20) and operative to convey two-dimensional information (See col. 7, lines 30-40), for example at different wavelengths of the source. Kley et al additionally discloses a curved reflector for collimating the light from the sources (See 1 in Figure 1; col. 8, lines 50-56); the sources (See 3A, 3B in Figure 1) illuminating the sample with at least a first beam and a second beam at the same time (See col. 9, lines 8-38); the beam also being concentrated by focusing (See for example col. 5, line 1-9; col. 5, lines 43-55); a plurality of narrow-band dielectric filter elements located in an optical output path of at least one of the sources (See 4A, 4B, 5A, 5B in Figure 1; col. 5, lines 29-42). Kley et al. also discloses the illumination sources being positioned to illuminate different sub-areas of the detection area and a first portion of the beams overlapping within the sample area (See Figure 1). The Examiner notes that light from each source 2, 3A, 3B of Figure 1 will overlap each other and illuminate a different portion of the detection area (i.e. the finger 6 in Figure 1). The combined illumination of the sources will fully illuminate the finger. Kley et al. also

discloses a plurality of reflectors each located in an optical path between one of the sources and the detector (See for example 1, 29 in Figure 4A).

Kley et al. discloses the invention as set forth above, except for the detector being a two-dimensional, multi-element infrared image detector, wherein the spectroscopic signal output is operative to convey two-dimensional spatial information about chemical properties of the sample surface based on the relative amounts of infrared light from the different beams received by the detector after reflection off of the different parts of the sample surface. However, the use of two-dimensional infrared detection arrays is well known in the art for chemical and spectroscopic imaging applications. For example, Erickson teaches a conventional chemical analysis and imaging system (See for example Figure 2), wherein an array of infrared illumination sources, the various sources in the array possibly having different infrared wavelengths, is used to generate incident infrared light onto a sample (See 10 in Figure 2; col. 1, lines 20-32; col. 13, line 52-col. 14, line 61; col. 17, line 14-col. 18, line 22). The infrared light either transmitted or reflected from the sample surface (See 15 in Figure 2) is detected by a two dimensional array of infrared detectors, producing two-dimensional spatial information about chemical properties of the sample surface (See 12 in Figure 2; col. 7, line 54-col. 8, line 29; col. col. 10, line 34-col. 11, line 18; col. 15, line 45-col. 16, line 12). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the detector be a two-dimensional multi-element infrared image detector, wherein the spectroscopic signal output is operative to convey two-dimensional spatial information about chemical properties of the sample surface based on the relative

amounts of infrared light from the different beams received by the detector after reflection off of the different parts of the sample surface, as taught by Erickson, in the spectrometer and method of Kley et al., to take advantage of time multiplexing of the acquisition of data, since no rastering is required, and multiple data at multiple locations are acquired at the same time (this effectively reduces the amount of time required to obtain thousands of data points at multiple locations on a sample).

13. Claims 14, 16-17, 25, 29, 40, 57, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kley et al. in view of Erickson.

With respect to Claims 14, 40, 57, Kley et al. in view of Erickson discloses the invention as set forth above in Claims 1 and 41, except for the sources being substantially the same. It is well known in the art to utilize multiple sources that are exactly the same to increase the amount of light flux incident on the sample. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the sources be substantially the same for the purpose of increasing the amount of light incident on the sample, and hence increase the signal-to-noise ratio of the measurement system.

With regard to Claims 16-17, Kley et al. in view of Erickson discloses the invention as set forth above in Claim 1. Kley et al. further discloses placing the sources near the detection area (See Figure 1 of Kley et al.). Kley et al. in view of Erickson lacks the spectrometer being either a microscopic or macroscopic instrument. The Examiner notes that the above limitations serve to adjust the luminous flux incident on the sample and adjust the image size of the detected luminous flux. Having the spectrometer be either a

microscopic or macroscopic instrument is merely that of preferred embodiments, and that no criticality has been disclosed in the specification of the disclosure. The reasons for having the spectrometer be either a microscopic or macroscopic instrument are given for example on Pages 3 and 11 of the specification of the disclosure. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the spectrometer be either a microscopic or macroscopic instrument, since one skilled in the art would have known to 1) design the size of the instrument appropriately based on optical performance and cost, and 2) design the optical portion of the instrument to provide the appropriate amount of light onto the sample at the detection area, and adjust and route the light to be detected to the appropriate detection system, all these based on optical performance, cost, and intended use of the instrument.

With regard to Claim 29, Kley et al. in view of Erickson discloses the invention as set forth above in Claim 1, except for the sources being connected to a single power supply. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the sources be connected to a single power supply, since one skilled in the art would know that one would drive a number of such sources with a single power supply to reduce the cost and complexity of the voltage/power supplying system.

With regard to Claim 25, Kley et al. in view of Erickson discloses the invention as set forth above in Claim 1, except for the sources being, for example, incandescent sources. However, the use of incandescent sources (e.g. quartz-tungsten-halogen bulb) in the apparatus is merely that of a preferred embodiment. No criticality for the use of such sources has been disclosed in the specification of the disclosure, and that the reasons for

the use of such sources are given for example on Pages 3 and 8 of the specification of the disclosure. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the sources be incandescent sources, since one skilled in the art would know to choose the appropriate light illumination sources based on requirements of wavelength, output power, and design considerations, such as cost, size and weight.

14. Claims 34-36, 65, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kley et al. in view of Erickson as applied to Claim 1 above, and further in view of Henderson et al. (U.S. Patent No. 3910701), of record.

With regard to Claims 34-35, 65, Kley et al. in view of Erickson discloses the invention as set forth above in Claim 1, except for the apparatus further comprising a circular support for the array of sources which surrounds an optical path from the detection area to the detector, wherein the detection area is located along a central axis of the circular support and wherein the support surrounds an optical path from the detection area to the detector. However, Henderson et al. teaches a method and apparatus for spectroscopic measurements (See for example Figures 2-3, 5-6), wherein a plurality of light sources (See for example 16a, 17c in Figure 3), such as LED's, is mounted on a circular support (See 13 in Figure 3; 15 in Figure 5), and the detection area (See 21 in Figure 3; 112 in Figure 5) is located along a central axis of the circular support, which surrounds an optical path from the detection area to the detector (See for example 18 in Figure 3; 106 in Figure 5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the detection area be located

along a central axis of the circular support and wherein the support and array of sources surround an optical path from the detection area to the detector, as taught by Henderson et al., in the apparatus of Kley et al. in view of Erickson, for the purpose of rigidly supporting the plurality of light sources, while reducing the size and weight of the system.

With regard to Claim 36, Kley et al. in view of Erickson, and further in view of Henderson et al. discloses the invention as set forth above, except for the detector being a part of a microscope. Having the detector be a part of a microscope is merely a recitation of a preferred embodiment, and no criticality has been cited for having the detector be a part of a microscope. The reasons for having the detector be a part of a microscope are given for example on Pages 3 and 10-11 of the specification of the disclosure. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the detector be a part of a microscope to reduce the size, weight, and cost of the optical system, since the microscope and the spectrometer are now integrated onto a single device.

15. Claim 38, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Kley et al. in view of Erickson as applied to Claim 1 above, and further in view of Malin et al. (U.S. Patent No. 6236047), of record.

Kley et al. in view of Erickson discloses the invention as set forth above in Claim 1, except for the detector including a plurality of detector elements, such as a linear detector array, wherein the detection area is divided into a plurality of detection sub-areas, and wherein each of the detector elements is aligned with one of the detection sub-areas.

However, Malin et al. teaches an apparatus for determining the concentration of an analyte present in a sample (See Figures 1A, 1B) as set forth above. In particular, Malin et al. teaches using an array of detector (See 18B in Figure 1B; 60 in Figure 2A, 2B). Additionally, it is well-known in the art of optical spectroscopy to divide the detection area/sample into small regions which are aligned with detector array elements designed to detect emission only from those regions, i.e. spatial or hyperspectral imagery (See for example Erickson). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the detector include a plurality of detector elements, such as a linear detector array, wherein the detection area is divided into a plurality of detection sub-areas, and wherein each of the detector elements is aligned with one of the detection sub-areas, as taught by Malin et al., in the spectrometer of Kley et al. in view of Erickson, for the purpose of providing spectroscopic measurement information based on location on the sample.

16. Claims 12-13, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kley et al. in view of Erickson.

Kley et al. in view of Erickson discloses the invention as set forth above in Claim 1, except for the reflectors being generally either parabolic or ellipsoidal. It is noted that the shape of the reflectors, whether planar, parabolic, ellipsoidal, or other non-standard shapes, is dictated by the optical design of the spectroscopic apparatus, and the choice of using a particular shaped reflector is dependent on whether the incoming light is required to be focused, collimated, or dispersed as the light is reflected off the surface. Therefore, it would have been well within the skill of worker in the art to have the reflector be

parabolic or ellipsoidal for the purpose of reducing the number of optical elements required, since such reflectors additionally perform collimating and focusing functions, as well as light-reflecting functions.

17. Claims 37, 50-56, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kley et al. in view of Erickson as applied to Claims 1, 41 above, and further in view of Miller et al. (U.S. Patent No. 6373568), of record.

Kley et al. in view of Erickson discloses the invention as set forth above in Claims 1, 41, except for a spectral matching module responsive to the spectroscopic signal output and operative to perform spectral matching operations with one or more known substances or samples, such as pharmaceuticals, pathological, or biological samples. It is well known in the art of optical spectroscopy to compare measured or detected optical spectra to reference optical spectra for the purpose of identification. Additionally, Miller et al. teaches a spectral imaging system (See for example Figure 4a) utilizing a plurality of sources (See 1 in Figure 4a; 10a-j in Figure 1) wherein a computer and program (See 63, 64 in Figure 4a) are used to perform weighting function calculations on spectral information such that further collected spectral data can be compared with this information to identify the samples (See Abstract; col. 4, lines 14-27; col. 9, line 11-col. 10, line 34). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a spectral matching module responsive to the spectroscopic signal output and operative to perform spectral matching operations with one or more known substances or samples, such as pharmaceuticals, pathological, or biological samples, as taught by Miller et al., in the spectrometer of Kley et al. in view of

Erickson, for the purpose of providing automated, highly accurate means of sample identification.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6122042 to Wunderman et al.

Wunderman et al. is being cited to further evidence similar photometric and spectrometric apparatus and methods to that of the recited invention (See specifically Figures 1-2, 4, 7-9).

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 9:30 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Arnel C. Lavarias
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12/15/05